

What is claimed is:

1. A micro-pattern embedded optical film that supports growth, identification and measurement of cells.
2. The micro-pattern embedded optical film as defined in claim1, wherein said  
5 micro-pattern contains straight and curved geometric shapes.
3. The micro-pattern embedded optical film as defined in claim1, wherein said micro-pattern contains numbers.
4. The micro-pattern embedded optical film as defined in claim1, wherein said micro-pattern contains letters.
- 10 5. The micro-pattern embedded optical film as defined in claim1, wherein said micro-pattern has dimensions that range from sub-micron to 5 millimeters.
6. The micro-pattern embedded optical film as defined in claim1, wherein said micro-pattern contains a coordinate system wherein each location on said optical film may be identified by a set of numbers or letters or combination of numbers and letters.
- 15 7. The micro-pattern embedded optical film as defined in claim1, wherein said micro-pattern contains a first side and a second side, wherein said first side contains embedded micro-patterns, wherein said second side contains no micro-pattern.
8. The micro-pattern embedded optical film as defined in claim1, wherein said micro-pattern contains a first side and a second side, wherein said first side and said  
20 second side both contain embedded micro-patterns.
9. The micro-pattern embedded optical film as defined in claim1, wherein said optical film has a plastic substrate.

10. A method of conducting cell-based assays using a micro-pattern embedded optical film.

11. The method as defined in claim 10, wherein said cell-based assays contain growth, identification and measurement of cells.

5 12. The method as defined in claim 10, wherein said optical film has a plastic substrate.

13. The method as defined in claim 10, wherein said optical film contains  
micro-patterns containing numbers or letters or combination of  
numbers and letters,  
10 and micro-patterns containing geometric shapes,  
and a coordinate system wherein each location on said optical film  
may be identified by a set of numbers or letters or combination  
of numbers and letters.

14. An apparatus with a micro-pattern embedded optical film that supports  
15 growth, identification and measurement of cells, said apparatus containing a micro-pattern embedded optical film and supporting components.

15. The apparatus as defined in claim 14, wherein said micro-pattern embedded optical film has a plastic substrate.

16. The apparatus as defined in claim 14, wherein said micro-pattern  
20 embedded optical film and said supporting components are connected by an adhesive layer.

17. The apparatus as defined in claim 16, wherein said adhesive layer is made of pressure sensitive adhesive.

18. The apparatus as defined in claim 16, wherein said adhesive layer is made of an energy curable adhesive.

19. The apparatus as defined in claim 14, wherein said apparatus contains plurality of assay locations.

5 20. The apparatus as defined in claim 14, wherein said micro-pattern embedded optical film is fabricated with a micro-replication technique containing the steps of

making a mold with the negative image of a desired micro-pattern,  
casting an uncured uv-curable polymeric material onto said mold,  
10 laminate a plastic substrate film onto said mold, wherein said uv-curable polymeric material is flattened between said plastic substrate and said mold,

irradiate, with an ultraviolet light, an assembly of said mold, said polymeric material, and said plastic substrate, to cause the  
15 uncured uv-curable polymeric material to be cured, and  
remove said plastic substrate, together with said cured uv-curable polymeric material, from said mold,

wherein said plastic substrate, together with said cured uv-curable polymeric material, becomes said micro-pattern embedded optical film.

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